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# LOCK – OUT \ TAG – OUT PROGRAM

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## **SECTION ONE – INTRODUCTION**

### **1.1 LOCK-OUT/TAG-OUT PROGRAM**

- 1.1.1 The Oregon Occupational Safety and Health Division of the Department of Insurance and Finance (OR-OSHA) has adopted new standards for the control of hazardous energy. This standard was imposed by Federal OSHA, January 2, 1990.
- 1.1.2 The Oregon Lock-out/Tag-out Rules are referenced very much like the federal standard as CFR 1910.147 and entitled “The Control of Hazardous Energy (Lock-out/Tag-out).” It is referenced under OAR Ch. 435, Oregon Occupational and Safety and Health Code, Division 2, Subdivision 0, Machinery and Machine Guarding; and Division 75, Pulp, Paper and Paperboard Mills, were repealed.
- 1.1.3 This policy takes into account all energy sources of a system, such as mechanical, hydraulic, chemical, nuclear, and thermal.

### **1.2 DEFINITIONS**

- 1.2.1 The term **lock-out** means using a lock and a device that, when in use, makes it impossible to activate a switch, circuit breaker, etc. that would set a machine/process in motion endangering an employee working on the machine/process.
- 1.2.2 The term **tag-out** means using a tag to warn against activation of a switch, circuit breaker, etc. that would set a machine/process in motion endangering an employee working on that machine/process. Tag-out is only utilized when a lock-out is not possible.
- 1.2.3 Locking-out to a “**Zero Energy State**” is a planned approach for service and maintenance safety, which takes into account the total energy of a system, and which eliminated the possibility of sudden or unexpected release of that energy during such service or maintenance functions.
- 1.2.4 **Authorized Employees** are those employees who approve/train individuals on the Lock-Out/Tag-Out procedure and those who are authorized to implement the Lock-Out/Tag-Out procedure.
- 1.2.5 **Affected Employees** are those employees who operate or work in the area of equipment from which power may be isolated, or who work in the area(s) where energy isolation is performed.

## **SECTION TWO – PURPOSE**

### **2.1 PREVENTION**

2.1.1 The purpose of the lock-out/tag-out policy is to prevent personal injury and property damage due to the accidental start up of machinery, equipment and/or process systems under repair or which maintenance is being performed.

2.1.2 Depending on the situation, energy sources could be electrical, hydraulic, pneumatic, chemical, thermal, spring-loaded or other energy.

2.1.3 Machines and equipment will also be disabled to further prevent unexpected energizing, start-up or release of stored energy. This will be done for the purpose of preventing injury to any employees during servicing or maintenance of power equipment.

### **2.3 PROTECTION**

2.3.1 University of Portland places a high priority upon the safety and well-being of all employees. To further our effort to protect employees from harm, this policy has been established.

2.3.2 It is intended that all power equipment shall be completely isolated from all power during servicing and maintenance.

2.3.3 This will be accomplished by affixing appropriate lock-out or tag-out devices to energy isolating devices.

## **SECTION THREE – LOCK-OUT/TAG-OUT RESPONSIBILITIES**

### **3.1 MANAGEMENT**

- 3.1.1 It is management's responsibility to develop an effective written Lock-out/Tag-out Program, communicate it throughout the work place and ensure that it is understood and followed.
- 3.1.2 Management needs to provide effective facilities for locking and tagging out power sources and process systems to prevent employees from accidentally coming into contact with potential exposures and being seriously or fatally injured.
- 3.1.3 Management needs to provide employees with personal locks and tags for their use in protecting themselves. Locks need to be identified with employee's identity (lock number, name, etc.). Color code alone is not sufficient.
- 3.1.4 Management will ensure all employees are properly trained, understand and know the Lock-out/Tag-out Rules and Procedures.
- 3.1.5 Management will ensure that a complete and current survey with respect to energy isolation for the Lock-Out/Tag-Out program is accomplished.
- 3.1.5.1 The survey shall be made available to all authorized employees.
- 3.1.5.2 The survey shall be updated as equipment is upgraded, removed, or replaced.
- 3.1.6 It is the responsibility of Management to ensure periodic review of the Lock-Out/Tag-Out procedures.
- 3.1.6.1 The reviewer should be a person or person(s) not directly utilizing the procedure.
- 3.1.6.2 The review should take into account:
- Field observance of procedures
  - Lock-out/tag-out equipment; e.g., type, quantity, availability
  - Policy relevance, understandability, availability

### **3.2 EMPLOYEES**

- 3.2.1 Each employee needs to know, understand, and follow the established Lock-out/Tag-out Safety Rules and Procedures.
- 3.2.2 Each employee needs to ensure that fellow employees are not exposed to the dangers of moving machinery, equipment, or process systems.
- 3.2.3 Employees, when in doubt, are encouraged to ask questions.

### **3.3 SPECIFIC RESPONSIBILITIES**

- 3.3.1 It is the responsibility of the person servicing or maintaining the equipment to place a personal lock and tag on the machine in accordance with the policy and procedures.
- 3.3.2 Servicing and/or maintenance includes such activities as constructing, installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or start-up of the equipment or release of hazardous energy.

## **SECTION FOUR – PROCEDURES**

### **4.1 WHEN TO LOCK OUT EQUIPMENT**

4.1.1 Equipment/machinery will be locked out under any of the following conditions:

4.1.1.1 Whenever someone is going to work on a piece of machinery, whether energized or not, where that person might be caught, struck, pinned, thrown, or in some way hurt by the movement of the machine. A “Zero Energy State” needs to be attained to prevent a sudden movement or unexpected release of energy.

4.1.1.2 Whenever there is a possibility of someone coming in contact with a live (i.e. energized) electrical part. When it is necessary to remove energy from a stored energy device such as a shear, flywheel, air pressure device, etc.

4.1.1.3 During shut down to prevent accidental start-ups.

4.1.1.4 During the time when plug-ups, hang-ups, bottlenecks, etc. cause individuals to leave the control stations and actually come into contact with or work in the point of operation to eliminate the problem.

NOTES: If there are questions about the safety of the machine, the responsible supervisor is required to decide if it should be locked out.

If continued operation of the machine may cause serious damage, the responsible supervisor is required to decide it is should be locked out.

### **4.2 WHO WILL LOCK-OUT EQUIPMENT**

4.2.1 Any individual who is authorized/designated and who is trained in the company’s lock-out/tag-out program for that piece of equipment or machinery.

### **4.3 WHERE TO LOCK-OUT EQUIPMENT**

4.3.1 Locks shall be placed, when possible, at the energy source; e.g.:

- Motor disconnect
- Branch poser switch
- Branch power breaker
- Feed Line
- Other sources of stored potential or kinetic energy

4.3.2 Circuit breaker panels, as a whole, are not acceptable lock-out points. REASON: In locking entire the panel, all of the other breakers will be locked out as well, preventing energy access.



- 4.3.3 The ON/OFF switch for the piece of equipment (whether on a pedestal, control or physically attached to the machine) does not constitute a lock-out point. The power source must be the lock-out point.

## **SECTION FIVE – SINGLE-LOCK SYSTEM**

### **5.1 PROCEDURE FOR USING A SINGLE LOCK SYSTEM**

5.1.1 Contact the operator and the area supervisor to tell them the machine is going to be locked out.

5.1.2 Lock-out the machine:

5.1.2.1 Electric – Stop motor, open disconnect switch and insert padlock through the lock-out hole. Check to see the switch is in the OFF or OPEN position.

5.1.2.2 Place the appropriate CAUTION tag stating one of the following:

- DO NOT OPEN
- DO NOT START
- DO NOT CLOSE
- DO NOT ENERGIZE OR
- DO NOT OPERATE

**CAUTION: DO NOT OPEN DISCONNECT SWITCH WHILE MOTOR IS RUNNING.**

5.1.2.3 If the machine or equipment has an air operated switch or valve, disconnect the air line or shut off the air downstream of the valve or switch. Then lock (if possible) or tag-out the air supply valve in the OFF or CLOSED position.

5.1.2.3.1 When disconnecting an air line, the line being disconnected is required to be tagged with the appropriate CAUTION tag, stating one of the following:

- DO NOT START
- DO NOT OPEN
- DO NOT CLOSE
- DO NOT ENERGIZE OR
- DO NOT OPERATE

5.1.2.3.2 When tagging out a valve or switch, the valve or switch must be placed in the OFF/CLOSED position and strapped with a nylon or equivalent device.

NOTE: When locking out valves, preferably use a chain or other suitable device to lock the valve handle, so it cannot be rotated even partially – once locked.

5.1.2.3.3 On hydraulic systems, shut down the pump and bleed lines to eliminate kinetic or potential energy sources or movement.

5.1.2.3.4 For other power sources not mentioned above, contact supervisor for lock-out instructions.

**CAUTION: MANY MACHINES STOP SLOWLY AS ROTATING PARTS SLOW DOWN. WAIT UNTIL THE ENTIRE MACHINE IS FULLY STOPPED AND ALL AIR AND HYDRAULIC PRESSURE IS BLED DOWN TO ZERO BEFORE WORKING.**

5.1.3 Start test equipment to make sure all energy sources have been disconnected – then proceed with the work to be done.

NOTE: When electrical lines must be disconnected to remove power to the equipment being maintained or repaired, all non-grounded conductors must be disconnected and tagged. (Remove the neutral and all other hot conductors unless the neutral is grounded to the grounding bus.)

5.1.4 When there are shift changes where an employee must remove his/her lock or locks, the new employee coming on duty (under a single lock system) must place his/her lock or locks on the lock-out sources prior to the removal of the off-going employee's lock (if possible), so the equipment is positively locked-out at all times.

5.1.5 When the work is complete, and the lock is to be removed, contact the operator and the area supervisor to inform them the lock is ready to be removed.

5.1.6 When cleared, the lock may be removed after the following checks have been made.

5.1.6.1 The person that placed the lock has gone back through the equipment to see that all tools have been removed and the equipment is ready to be operated – in accordance with the energy control checklist.

5.1.6.2 That person then removes his/her lock and start tests the equipment to make sure it is operable.

## **5.2 LOCK REMOVAL WHEN EMPLOYEE IS NOT PRESENT**

5.2.1 Only the employee's immediate supervisor or the department's director/assistant director are authorized to remove the employee's lock or tag.

5.2.2 This shall only be accomplished when the employee is unable to perform the lock or tag removal and circumstances warrant immediate removal action.

5.2.3 The supervisor or director/assistant director removing the lock or tag shall bear full responsibility for the removal action.

## **SECTION SIX – MULTI-LOCK SYSTEM**

### **6.1 PROCEDURE FOR USING A MULTIPLE LOCK SYSTEM**

6.1.1 Follow the procedure for a single lock system with the following exceptions:

6.1.1.1 If known in advance that more than one person is going to lock-out the machine, then use the multi-lock device with the first lock.

6.1.1.2 If the machine is already locked out – DO NOT RELY ON THE OTHER PERSON—USE YOUR LOCK ALSO.

6.1.1.3 Locate the other person (his/her name will be on the tag) and together install a multi-lock device.

6.1.1.4 When your part of the work is completed, notify the operator and appropriate supervisor that your work is done and that there are other locks remaining on the machine.

6.1.1.4.1 Then remove your lock.

6.1.1.4.2 Special precautions need to be relayed to the supervisor.

### **6.2 LEAD PERSON RESPONSIBILITY**

6.2.1 In a multiple lock system, there needs to be a lead person whose lock is required to be the last lock off and who is required to inspect the equipment to determine that the machine/equipment/process is operable.

6.2.2 The lead person is also responsible for start testing the machine/equipment or process.

## **SECTION SEVEN – RESPONSIBILITIES & TRAINING**

### **7.1 RESPONSIBILITY**

#### 7.1.1 General

7.1.1.1 Safety is everyone's responsibility; the life you save may be your own.

7.1.1.2 No employee is permitted to work under another employee's lock (no group lock-out)

#### 7.1.2 Individual

7.1.2.1 Notify the operator and area supervisor whenever he/she uses or removes a lock-out device.

7.1.2.2 Remove his/her lock and tag when it is safe to do so.

7.1.2.3 Notify his/her supervisor and operator if he/she leaves his/her lock on the system after the end of the shift, and the reason for doing so.

7.1.2.4 To use his/her lock only for lock-out purposes.

7.1.2.5 In the event that an individual needs more than his/her aligned locks, he/she can checkout extra locks from the storeroom, provided the locks are properly identified to the individual.

#### 7.1.3 Supervisor

7.1.3.1 Follow-up on any locks left in place. If a lock is left in place, the supervisor is responsible to notify the employee and have the lock removed—if the employee is not available, the supervisor is to follow the lock removal procedures.

7.1.3.2 Ensure that locks and tags are being used where needed.

7.1.3.3 Supervise lock-out procedures.

#### 7.1.4 Senior Management (Director/Assistant Director)

7.1.4.1 Maintain an adequate supply of locks aligned to the various individuals.

7.1.4.2 Maintain an updated list of locks assigned to the various individuals.

7.1.4.3 Maintain a supply of tags to be used with the locks.

## 7.2 TRAINING

7.2.1 Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary to obtain a “Zero Energy State”.

7.2.1.1 Employees will also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy isolating device, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags will be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment will be made of materials which will withstand the environmental conditions encountered in the workplace.
- It is important tags do not evoke a false sense of security. To avoid this, their meaning needs to be understood as part of the overall energy control program.
- Tags will be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

7.2.2 Each affected employee will be instructed in the purpose and use of the energy control procedure.

## **SECTION EIGHT – INSPECTIONS**

### **8.1 PERIODIC INSPECTIONS**

- 8.1.1 Periodic inspections of the energy control procedure will be conducted at least annually to ensure the procedure and the requirements are being followed.
  - 8.1.1.1 The periodic inspection will be performed by a Senior Management representative other than the one(s) utilizing the energy control procedure being inspected.
  - 8.1.1.2 The periodic inspection is designed to correct any deviations or inadequacies observed.
  - 8.1.1.3 Where lock-out is used for energy control, the periodic inspection will include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
  - 8.1.1.4 Where tag-out is used for energy control, the periodic inspections will include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth under RESPONSIBILITY AND TRAINING.

### **8.2 DEVIATION**

- 8.2.1 The consequences of deviating from this policy can be severe in terms of human suffering and loss.
- 8.2.2 Deviations of this policy will be addressed aggressively, with a goal of determining how to improve the procedures so that no similar deviations will occur.

## **SECTION NINE – ENERGY CONTROL CHECKLIST**

### **9.1 CHECKLIST ESTABLISHMENT**

9.1.1 An Energy Control Checklist shall be established to assist authorized employees in the use of Lock-Out/Tag-Out procedures.

9.1.2 The checklist shall be in three parts:

- Energy source(s) identification
- Lock-Out/Tag-Out procedure
- Re-energizing procedure

### **9.2 CHECKLIST USAGE**

9.2.1 The use of the Energy Control Checklist is not mandatory.

9.2.2 Checklist usage is left to the individual authorized employee.

9.2.3 It is highly suggested the checklist be implemented, especially for larger-scale lock-out/tag-out projects.



# **APPENDIX I**

## **LOCK-OUT/TAG-OUT ENERGY CONTROL CHECKLIST**

(For the Authorized Person to complete at the time of implementation)

### **CHECK-OFF STEP IN SEQUENCE**

#### **WHEN WORKING ON ANY EQUIPMENT**

- [ ] IDENTIFY and LOCATE all sources of power to the equipment.
- [ ] NOTIFY all affected personnel what equipment is going to be de-energized and worked on.
- [ ] DISCONNECT the main sources of power by opening the primary power switch, valve, etc. Secondary power sources such as isolation breakers, control panel switches, and console buttons are NOT acceptable (even if they have a key lock).
- [ ] DISCONNECT EACH separate power source of multiple power systems, i.e.: air over hydraulic, electric over hydraulic, etc.
- [ ] RELEASE all residual energy remaining behind the power source, i.e.: hydraulic or air pressure, etc.
- [ ] SECURE all power sources in the de-energized position with a positive means, i.e.: padlock, chain, cable, etc.
- [ ] BLOCK or restrain any machinery or device that can move on its own, with or without the power source. If chains or lines are used, anchor them solidly without winches or “come-alongs”.
- [ ] AFFIX a lock or warning tag identifying who attached and the date it was attached. EACH person working on a piece of equipment shall affix his own lock or tag.
- [ ] TEST the equipment prior to working on it by manipulating the operating controls. Return the operating controls to the neutral position.

**IF THE LOCK-OUT/TAG-OUT PROCEDURE MUST BE INTERRUPTED TO TEST A REPAIR OR ADJUSTMENT, THE FOLLOWING PROCEDURE MUST BE FOLLOWED.**

- CONTACT the Senior Management Representative appointed to be in charge of isolating energy sources.
- NOTIFY all affected personnel
- BEFORE RE-ENERGIZING:
  - CHECK to make sure all personnel are clear
  - REMOVE blocking, chains, tie-downs, etc., and any tools, parts, or materials that may have been left behind
  - REPLACE your lock or tag ONLY when your work is completed
- REMOVE your lock or tag ONLY when your work is completed.
- THE LAST person to remove his lock or tag is the authorized person and is responsible for re-energizing the equipment.
- BEFORE RE-ENERGIZING
  - NOTIFY all affected personnel
  - CHECK to make sure all personnel are clear
  - REMOVE blocking, chains, tie-downs, etc., and any tools or parts that may have been left behind
  - REPLACE barricades, guards, enclosures, etc.
  - TURN this checklist in to your supervisor when it has been completed.

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Signature Authorized Employee/ Time/Date

## **APPENDIX II**

### **LOCK-OUT/TAG-OUT TRAINING PROGRAM: KEY POINTS**

#### **General Rules**

- [ ] Procedures developed, documented and utilized for control of potentially hazardous energy.
- [ ] Employer has provided locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing or blocking machines or equipment.
- [ ] Lock-out/Tag-out devices singularly identified.
- [ ] Lock-out/Tag-out devices are used only for controlling energy.
- [ ] Lock-out/Tag-out devices are not used for other purposes.
- [ ] Durable—Lock-out/Tag-out devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- [ ] Standardized—Lock-out/Tag-out devices must be standardized within each facility in at least color, shape or size.
  - [ ] For tag-out devices, also standardize print and format.
  - [ ] Must be legible and understandable. (Bi-lingual?)
- [ ] Identifiable—Lock-out/ Tag-out devices must indicate the identity of the employee applying the devices.
- [ ] When major modifications are made to machinery electrical systems or when new machinery is installed, the energy source must be designed to accept a lock-out device.
- [ ] Inspection—At least annually.
  - [ ] Performed by authorized employee other than those utilizing energy control procedure under inspection.
  - [ ] Designed to correct any deviations or inadequacies observed.

[ ] Include review of each authorized employee's responsibilities under procedure. If tag-out is used, then include review of limitations of tags.

[ ] Substantial: Tag-out services and means of attachment.

[ ] Sufficient to prevent inadvertent or accidental removal.

[ ] Attachment means—non-reusable type; attached by hand; self-locking; non-releasable with minimum unlocking strength no less than 50 pounds; at least equivalent in design and characteristics to one-piece, all-environment-tolerant nylon cable tie.

[ ] **Warnings**

[ ] Warn against hazardous conditions if machine or equipment will be or is energized.

[ ] Legend such as "Do Not Start", "Do Not Close", "Do Not Energize", "Do Not Operate".

[ ] **Training: limits to tags.**

[ ] Warning devices, not physical restraint.

[ ] Do not remove without authorization; never by-pass, ignore, or otherwise defeat tag.

[ ] Must be legible and understandable.

[ ] Tags and means of attachment must be made of materials that will withstand workplace environmental conditions.

[ ] May evoke false security; understand meaning.

[ ] Securely attached to energy isolating devices.

[ ] **Application**

[ ] Clearly indicate that the operation or movement of energy isolating devices from "safe" or "off" position is prohibited.

[ ] Attach at the same point that lock would have been attached (if lock-out capability exists).

[ ] If cannot affix to energy isolating device, then affix as close as safety possible and in an obvious position.